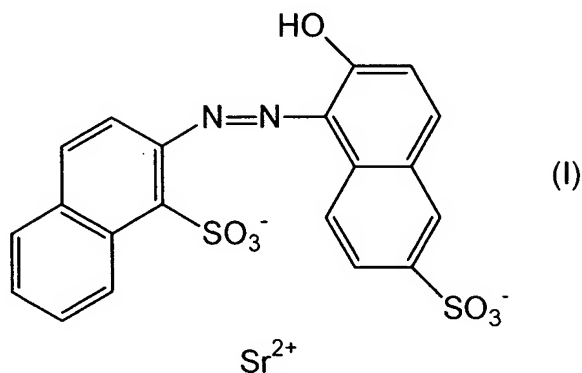


Claims

What is claimed is:

1. A red pigment represented by Formula I:

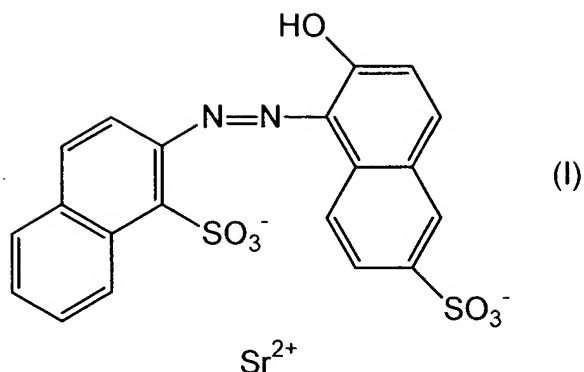


having an X-ray diffraction pattern comprising high diffraction intensities at diffraction angles of about 10.4°, about 17.5°, about 18.7°, about 21.6° and about 23°; moderate diffraction intensities at about 14.4°, about 15°, about 24.4°, about 24.8°, about 25.2° and about 26.2°; and low diffraction intensities at about 15.4°, about 17.5°, about 17.8°, about 19.3°, about 20°, about 21°, about 21.8°, about 26.6°, about 28.6°, about 30.2°, about 31.6°, about 32.1°, about 34.8° and about 38°.

2. An essentially pure red pigment according to claim 1.

3. A composition comprising a major amount of the red pigment according to claim 1 and a minor amount of a supplemental pigment formed by coupling a diazotized supplemental aromatic amine with a supplemental naphthalene coupler and metallizing with strontium.

4. A red pigment composition comprising:
a major amount of a pigment represented by Formula I:



5 and a minor amount of at least one of an amine surfactant and a sulfosuccinate surfactant.

5. The red pigment composition according to claim 4 consisting essentially of the pigment represented by Formula I and the amine surfactant.

10 6. The red pigment composition according to claim 4, wherein the amine surfactant is at least one selected from the group consisting of amine oxide surfactants and ethoxylated amine surfactants.

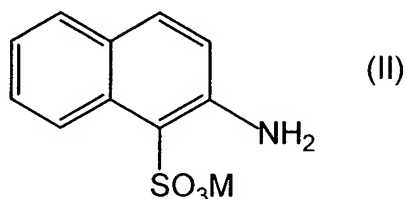
15 7. The red pigment composition according to claim 4, wherein the amine surfactant is at least one selected from the group consisting of N,N-bis(2-hydroxyethyl)cocoalkylamine oxide, N,N-dimethylcocoalkylamine oxide, alkylamine-guanidine polyoxyethanol, dimethyl (hydrogenated tallow) amine oxide, dimethylhexadecylamine oxide, bis(2-hydroxyethyl)tallowamine oxide, coco amidopropyl amine oxide, lauryl (12,14,16 blend) dimethyl amine oxide, 20 myristyl dimethyl amine oxide, cocamidopropylamine oxide, and stearyl dimethylamine oxide.

8. The red pigment composition according to claim 4, wherein the

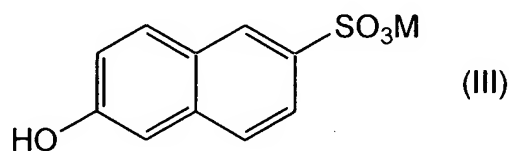
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pigment represented by Formula I has an X-ray diffraction pattern comprising high diffraction intensities at diffraction angles of about 10.4°, about 17.5°, about 18.7°, about 21.6° and about 23°; moderate diffraction intensities at about 14.4°, about 15°, about 24.4°, about 24.8°, about 25.2° and about 26.2°; and low diffraction intensities at about 15.4°, about 17.5°, about 17.8°, about 19.3°, about 20°, about 21°, about 21.8°, about 26.6°, about 28.6°, about 30.2°, about 31.6°, about 32.1°, about 34.8° and about 38°.

9. A method of making a red pigment composition comprising:
coupling a diazonium component comprising a compound prepared from an aromatic amine represented by Formula II



wherein M is any one of H, Li, Na, $\frac{1}{2}$ Mg, K, $\frac{1}{2}$ Ca, $\frac{1}{2}$ Sr, NH_4 , $\text{NR}_{4-x}\text{H}_x$, wherein R is an alkyl or alkoxy group containing 1 to 4 carbon atoms and x is 0 to 3 with a coupling component comprising an aromatic sulfonic acid coupler represented by Formula III



wherein M is any one of H, Li, Na, $\frac{1}{2}$ Mg, K, $\frac{1}{2}$ Ca, $\frac{1}{2}$ Sr, NH_4 , $\text{NR}_{4-x}\text{H}_x$, wherein R is an alkyl or alkoxy group containing 1 to 4 carbon atoms and x is 0 to 3 at a pH of about 3 or more and below about 9; and

metallizing with a strontium salt, wherein at least one of the coupling and the metallizing is conducted in the presence of at least one of an amine surfactant and a sulfosuccinate surfactant.

5 10. The method according to claim 9, wherein metallizing is conducted in the presence of the amine surfactant, the amine surfactant is at least one selected from the group consisting of amine oxide surfactants and ethoxylated amine surfactants.

10 11. The method according to claim 9, wherein the diazonium component further comprises a minor amount of a supplemental compound prepared from at least one supplemental aromatic amine selected from the group consisting of 2-amino-5-methoxy-benzenesulfonic acid; 2-amino-5-ethoxy-benzenesulfonic acid; 2-amino-4-chloro-5-methoxy-benzenesulfonic acid; 2-amino-4-chloro-5-ethoxy-benzenesulfonic acid; 2-amino-4-methyl-5-methoxy-benzenesulfonic acid; 2-amino-4-ethyl-5-methoxy-benzenesulfonic acid; 2-amino-4,5-dimethoxy-benzenesulfonic acid; 2-amino-4-methyl-5-ethoxy-benzenesulfonic acid; 2-amino-4-ethyl-5-ethoxy-benzenesulfonic acid; 2-amino-4,5-diethoxy-benzenesulfonic acid; 2-aminobenzene-1-sulfonic acid; 4-aminobenzene-1-sulfonic acid; 2-amino-5-methylbenzene-1-sulfonic acid; 3-amino-6-methylbenzene-1-sulfonic acid; 2-amino-4-chloro-5-methylbenzene-1-sulfonic acid; 2-amino-5-chloro-4-ethylbenzene-1-sulfonic acid; 2-amino-5-chloro-4-methylbenzene-1-sulfonic acid; 3-aminobenzoic acid; 4-aminobenzoic acid; 2-amino-5-methylbenzoic acid; 2-amino-6-methylbenzoic acid; 3-amino-2-methylbenzoic acid; 2-amino-3-methoxybenzoic acid; 4-amino-3-methoxybenzoic acid; 4-amino-5-chloro-2-methoxybenzoic acid; 2-amino-4-chlorobenzoic acid; 3-amino-4-chlorobenzoic acid; 1-naphthyl amine; 2-naphthyl amine; 4-aminonaphthalene-1-sulfonic acid; 4-aminobiphenyl-3'-sulfonic acid; 4,4'-diaminobiphenyl-2,2'-disulfonic acid 2-methoxy-4-nitroaniline; 2-methoxy-5-

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nitroaniline; 4-methoxy-2-nitroaniline; 2-amino-4-chloro-5-nitrotoluene; 2-chloro-4-nitroaniline; 2-chloro-5-nitroaniline; 4-chloro-2-nitroaniline; 4-chloro-3-nitroaniline; 5-chloro-2-nitroaniline; 5-chloro-2-methyl-4-nitroaniline; 2-chloro-4-methylaniline; 2-chloro-5-methylaniline; 2-chloro-6-methylaniline; 3-chloro-2-methylaniline; 3-chloro-4-methylaniline; 4-chloro-2-methylaniline; 5-chloro-2-methylaniline; 4-chloro-2-methoxy-5-methylaniline; 4-chloro-2,6-dinitroaniline; 6-chloro-2,4-dinitroaniline; 2-chloro-4,6-dimethylaniline; 3-chloro-2,6-diethylaniline; 4-chloro-2,6-dibromoaniline; 2-chloroaniline; 3-chloroaniline; 4-chloroaniline; 5-chloro-2-methoxyaniline; 3-chloro-4-methoxyaniline; and aniline.

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12. The method according to claim 9, wherein the coupling component further comprises a minor amount of at least one supplemental naphthalene coupler selected from the group consisting of naphthalene; naphthalene-1-sulfonic acid; naphthalene-1,3-disulfonic acid; naphthalene-2-sulfonic acid; 2-naphthoic acid; 2-naphthol; 3-naphthol; 1-naphthoic acid; 1-hydroxynaphthalene-2,7-disulfonic acid; 3-hydroxynaphthalene-1-sulfonic acid; 2-hydroxynaphthalene-1-sulfonic acid; 5-hydroxynaphthalene-1-sulfonic acid; 1-hydroxynaphthalene-3-sulfonic acid; 1-nitronaphthalene; and 1-chloronaphthalene.

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13. The method according to claim 9, wherein the aromatic amine represented by Formula II comprises 2-aminonaphthalene-1-sulfonic acid and the aromatic sulfonic acid coupler represented by Formula III comprises a sodium salt of 2-hydroxynaphthalene-6-sulfonic acid.

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14. The method according to claim 9, wherein coupling is conducted in the presence of the amine surfactant, the amine surfactant is at least one selected from the group consisting of amine oxide surfactants and ethoxylated amine surfactants at a pH of about 4 or more and about 8 or less.

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15. The method according to claim 9, wherein coupling is conducted in the presence of the amine surfactant at a pH of about 4.5 or more and about 7.5 or less.

5 16. A plastic composition comprising a major amount of a plastic and a minor amount of the red pigment according to claim 1.

10 17. The plastic composition according to claim 16, wherein the plastic comprises at least one selected from the group consisting of polystyrene, polyolefins, polyacrylic compounds, polyvinyl compounds, polyesters, filaments made of viscose and cellulose ethers, cellulose esters, polyamides, polyurethanes, polycarbonates, polyimides, and polyacrylonitrile.

15 18. A plastic composition comprising a major amount of a plastic and a minor amount of the red pigment composition according to claim 4.

 19. A plastic composition comprising a major amount of a plastic and a minor amount of the red pigment composition made according to claim 9.

20 20. A coating composition comprising a major amount of a coating vehicle and a minor amount of the red pigment according to claim 1.

 21. A coating composition comprising a major amount of a coating vehicle and a minor amount of the red pigment composition according to claim 4.

25 22. A coating composition comprising a major amount of a coating vehicle and a minor amount of the red pigment composition made according to claim 9.

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23. An ink composition comprising a major amount of an ink vehicle and a minor amount of the red pigment according to claim 1.

5 24. An ink composition comprising a major amount of an ink vehicle and a minor amount of the red pigment composition according to claim 4.

25. An ink composition comprising a major amount of an ink vehicle and a minor amount of the red pigment composition made according to claim 9.

10 26. An electrostatic toner composition comprising a major amount of an electrostatic toner and a minor amount of the red pigment according to claim 1.

15 27. An electrostatic toner composition comprising a major amount of an electrostatic toner and a minor amount of the red pigment composition made according to claim 9.